

REMARKS

The Applicants respectfully request that the foregoing amendments be made prior to examination of the present Application.

Claims 1-40 are requested to be cancelled without prejudice to further the prosecution on the merits.

Claims 41-86 are being added.

After amending the claims as set forth above, claims 41-86 are now pending in this Application.

The Applicants also expressly withdraws and disavows any and all claim amendments and remarks (including remarks directed to or about any cited reference) made in connection with the parent applications (PCT Application No. PCT/EP2004/000911), or in connection with any related application. The Applicants do not intend any prior claim amendment or remark in the parent application or any related application to have any effect on the prosecution or scope of the single claim in the present Application.

The Applicants believe that the present Application is now in condition for allowance. Favorable consideration of the Application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present Application.

Respectfully submitted,

Date 8/3/2005

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[MARKED UP VERSION OF SUBSTITUTE SPECIFICATION]**Interior fitting for a vehicle and
method for the production thereof**

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CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] The present invention claims priority as a national stage application of International Patent Application Serial No. PCT/EP2004/000911 filed on February 4, 2004; and German Patent Application Serial No. 10341471.1 filed on September 5, 2003; and German Patent Application Serial No 10304512.0 filed on February 4, 2003, which are hereby incorporated herein by reference in their entirety.

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BACKGROUND

[0002] The invention relates to an interior fitting for a vehicle, in particular for a motor vehicle, comprising a support body which is provided, at least in some regions, with a sensor-functional planar structure and with a covering layer on the side facing the interior, it being possible for different output signals to be generated by means of the planar structure as a function of the location of action thereupon. The invention furthermore relates to a method for operating a vehicle with the use of interior fittings of this type and to a method for the production thereof.

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[0003] Patent specification US 5,864,105 discloses a fitting according to the generic type in the form of a seat for a motor vehicle. The seat is provided with an operating device for a seat adjustment, which has a touch-pad arranged on a side surface, a touch-sensitive sensor field with two-dimensional resolution. The

touch-pad is provided in some regions with a covering layer of a hard plastic, in which recesses are arranged in the design of the seat projection. The touch-pad is directly touched through these recesses by the 5 operator's finger and brings about an adjustment of the seat as a function of the zone of action upon it. The contour of the recess is used here both for the visual and the tactile orientation of the operator.

10 [0004] This operating device has the disadvantage that | the touch-pad is exposed directly to a considerable mechanical stress and to environmental influences.

15 [0005] Furthermore, patent specification US 5,952,630 | describes an armrest for a door lining, in which a plurality of operating elements are used, arranged as force-sensitive sensors within or below the outer decorative layer of the armrest. In this case, each sensor takes on the function of a conventional, 20 mechanical switch or push-button with the soft haptic appearance of the surface of the decorative layer being retained.

25 [0006] Of disadvantage here is the necessity of using | in each case at least one dedicated sensor element for each function which is to be controlled, which entails complicated wiring and leads to space problems on account of the area required.

30 [0007] In addition, laid-open specification | DE 101 33 896 A1 describes a display which covers an airbag covering and can be used, inter alia, to depict navigation information, it being possible, if appropriate, for the display to be changed by means of 35 a touch operation, in an embodiment as a "touch screen". In this case, the realization in the form of

an image-providing film makes it possible to match it to the contour predetermined by the airbag covering.

5 [0008] Since the main attention here is focused on the quality of the image depiction, a wear-resistant covering layer cannot be used. A further disadvantage is that this solution is very cost-intensive.

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SUMMARY

[0009] The invention is based on the object of providing an interior fitting for a vehicle with operating devices which can be designed in a variable manner and, if appropriate, can be operated intuitively. Furthermore, an arrangement of the operating devices on surfaces of the interior fittings that have not been used for this purpose up to now is to be possible.

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[0010] The object is achieved according to the invention in that, in the case of an interior fitting of the generic type, the covering layer is of flexible design and completely covers the sensor-functional planar structure. Impairments due to environmental influences, soiling or wear can therefore be kept away from the sensor-functional planar structure, while at the same time improving the aesthetic appearance. This improvement may reside in the uniformity of the appearance. For this purpose, it is advantageous to use, for the formation of the covering layer, the same materials, for example textiles, leather or artificial leather or films, which are used in any case for the production of surfaces for interior fittings - for example roof lining, dashboard support or door linings.

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[0011] An embodiment of the sensor-functional planar structure as a pressure-sensitive sensor unit is advantageous because, as a result, the operating method as is also used in the case of conventional switches or push-buttons and to which the user is accustomed can be retained. At the same time, during the touching which is inherent to the operating process, the haptic, often soft sensation of the interior fitting is imparted to the operator. In order to emphasize this effect, a compressible intermediate layer can be fitted either between covering layer and sensor-functional planar structure or between sensor-functional planar structure and the support body, there being a further preferred variant, particularly in the first case, according to which this layer additionally contains in punctiform fashion molded pieces of increased stiffness. As a result, the flexibility of the surface of the interior fitting is largely retained in the case of compressive stressing over a large area while an application of force over a small area of the covering layer is passed on primarily via the molded pieces. A compressive stress is therefore applied particularly to those zones of the sensor-functional planar structure which are situated directly under them; there is therefore a concentration function.

[0012] Also advantageous is the arrangement of an intermediate layer having a rubber-elastic character, for example of silicone material, in the manner of a keypad mat. In addition to the concentration of the application of force to the regions of the sensor-functional planar structure directly below the key regions of the keypad mat, a haptic feedback about the actuation to the operator can therefore additionally be obtained with the use of the customary, nonlinear configuration of the restoring force of the key element in relation to the actuating distance.

[0013] The depiction of a meaning of an operating panel can be achieved in a simple manner with the assistance of visual means, for example colored contrasting of an operating panel from its surroundings or equipping with symbols or pictograms.

[0014] Provision is made here for a number of reasons to design the covering layer which bears means of this type in a manner such that it can be interchanged. First of all, a renewal of the covering layer if it has become worn or dirty can therefore be carried out. It is furthermore thus possible to reconfigure the operating element by, for example, the pictograms or symbols indicating a meaning being changed by exchanging them.

[0015] An advantageous embodiment of the invention furthermore arises by the integration of an illuminating device in the interior fitting, as a result of which an identification of functional zones of an operating panel can be assisted or brought about.

[0016] A flat variant can preferably be used as the illuminating device in order to avoid restrictions in the construction of the interior fitting, for example an electroluminescent film, an OLED or polyLED. The preferred position of this component arises here from the boundary conditions concerned with design. Given a sufficient degree of transmission of the sensor-functional planar structure and the covering layer, for example in an embodiment in textile material, an arrangement of the light source under these layers is possible, particularly directly under the sensor-functional planar structure.

[0017] A further advantageous variant of the visual orientation assistance reside in the incorporation in the light-conducting fibers in a layer which is suitable in terms of its construction for this, for example a textile covering layer. The regions which are to be depicted can therefore be delimited with particularly sharp contours.

[0018] Another aid to the visual orientation can be provided in the projection of light patterns onto those regions which are to be identified of the surface on the side facing the interior, with the advantage of improved perceptibility of the meaning, even from unfavorable viewing angles. It may be advantageous, in particular for a vehicle driver, to make possible for him an orientation in the operating process that does not require visual contact with the operating element. Taktile Tactile means may be used for this situation.

[0019] One preferred variant is the use of a structured molded part which can be provided with recesses in order thereby to delimit a subregion of the operating surface and thus to provide it with a separate meaning.

[0020] For example, an ovally shaped ring structure can be realized, the diameter of which lies in the order of magnitude of a human hand, the inner region defining a zone without a fixed allocation of functions and being used for inputting parameters by means of a stroking movement. This stroking movement can be detected via its property as a continuous stringing together of different locations of action of force on the sensor-functional planar structure, from which information about the direction and/or the speed of the stroking movement can be derived. The embodiment furthermore has molded elements which are embedded in

the ring structure and, mounted flexibly, when operated pass on the applied force in the direction of the sensor-functional planar structure, corresponding to the actuation of the key element of a keypad mat. With 5 such a device according to the invention, combined operating actions can be carried out, in which, for example, first of all a selection of the function to be operated takes place by pressing a key and then the parameterization of the function, for example an 10 adjusting direction or a displacement path, is determined in more detail by a stroking movement.

[0021] A further possibility for clarifying or identifying operating regions with particular preferences with regard to the aesthetic impression resides, with the elasticity of a covering layer being used, in not producing the structures used for the tactile orientation permanently during the production phase but rather by forming them by means of structural bodies which are arranged below the covering layer, for 20 example electrodynamically shape-variable or controllably moveable structural bodies.

[0022] Especially for the operation of thermal functions, it may be advantageous to provide the tactile orientation in just such a manner, for example by the use of heating wires or Peltier elements.

[0023] According to the invention, an interior fitting 30 for a vehicle is furthermore provided which preferably has an operating panel, the operating panel having a central region and a plurality of peripheral regions. By this means, a simple and intuitive operation of various components of the vehicle is possible via a 35 single operating panel.

5 [0024] The central region of the operating panel is preferably round. This firstly has the advantage that a visually attractive design of the operating panel is possible and, secondly, that furthermore the operation
is facilitated. The expert knows that it is, of course, also possible to design the central region of the operating panel differently, for example in an angular, square, rectangular or else oval manner.

10 15 [0025] Furthermore preferred according to the invention is an embodiment in which the peripheral regions of the operating panel are arranged in the manner of sectors around the central region. This in particular permits an intuitive operating guidance which also makes it possible to easily associate the operations carried out on the operating panel with their effects or consequences, in particular on different vehicle components.

20 25 [0026] It is furthermore preferred that the peripheral regions of the operating panel completely surround the central region of the operating panel. This makes it possible to design the operating panel to have an even greater aesthetic effect. In addition such a configuration of the operating panel affords the possibility of operating a multiplicity of vehicle components and nevertheless of keeping the expansion of the operating panel comparatively small.

30 35 [0027] It is furthermore preferred that the interior fitting is assigned a display device, with it being possible for information items to be displayed on the display device as a function of an operating mode. The combination of the interior fitting according to the invention with a display device makes it possible to use the interior fitting virtually universally to

control vehicle components. This permits a very greatly increased variability in the operating possibilities and furthermore results in it being possible to save a multiplicity of mechanical components, in particular switches and the like, in the vehicle, which has the effect of enabling the costs of the vehicle to be considerably reduced or of enabling a corresponding increase in comfort to be obtained at the same costs.

10 [0028] It is preferably furthermore provided that different vehicle components can be operated by means of the operating panel as a function of the operating mode. This makes it possible to make the operation of the vehicle components simple and to permit an 15 intuitive operation of the vehicle components because each operating mode is unambiguously assigned a component, so that operating errors can be largely eliminated.

20 [0029] It is furthermore provided that the operating mode can be changed as a function of the actuation of the central region and/or of the peripheral regions of the operating panel, preferably as a function of the actuation of the peripheral regions of the operating 25 panel. This makes it possible according to the invention to assign an unambiguous assignment of the operating mode, i.e. preferably of the vehicle component to be operated, for the actuation of parts of the operating panel. The operator's guidance for the 30 operating panel is particularly intuitive and simple if (solely) the peripheral regions of the operating panel are used for the definition of the operating mode.

[0030] It is furthermore preferred that a different 35 operating mode is assigned the operation of a different vehicle component, in particular the air-conditioning

control, the ventilation, a car radio, a navigation device, a car telephone, an audio configuration system, a fuel information system and/or a mobility information system. It is thereby possible in an advantageous 5 manner to assign just one vehicle component or a group of vehicle components which can usually be operated together to just one operating mode, which further simplifies the operation of the operating panel and also renders it accessible for less skilled users. In 10 this case, a mobility information system is to be understood as meaning a plurality of subsystems required for the mobility of the vehicle, for example the battery capacity or the functioning of the power supply in the vehicle, for example the oil pressure 15 and/or the oil temperature or else the tire pressure or the state of the tires.

[0031] It is furthermore preferred that, when an 20 operating mode is set, the operation of the vehicle component assigned to the set operating mode takes place as a function of the actuation of the central region and/or of the peripheral regions of the operating panel, preferably as a function of the actuation of the central region of the operating panel. 25 This makes it possible according to the invention for the operation of the assigned vehicle components to take place in a simple and intuitive manner. In particular if an operation of a vehicle mode component which is firmly defined by the set operating mode is 30 carried out exclusively by the actuation of the central region of the operating panel, a clear and easily comprehensively structuring of the operation of the vehicle components is produced to the effect that it is always the central region of the operating panel that 35 is used for operating the set vehicle component.

[0032] It is furthermore preferable that the actuation of a central region enables a list selection, which can be displayed on the display device, of functions and/or information items which can be displayed to be carried 5 out. As a result, it is possible, for example for the case of controlling the fuel information system, to carry out one of various functions by means of list selection. For example, one of the functions displayed on the display device as a list relates to the distance 10 which can probably still be covered by the contents of the fuel tank or the average fuel consumption or the fuel consumption at a particular instant or similar information items. Such functions or information items can be realized and displayed by actuation of the 15 central region of the operating panel, for example by means of a double click.

[0033] Furthermore, provision is preferably made for the actuation of the central region to enable a map excerpt, which can be displayed on the display device, to be displaced by a directional actuation and to be changed in size (zoomed in/out) by a rotary movement, the map excerpt being in particular the single map excerpt displayed on the display device. It is thereby 20 possible, in a particularly simple, intuitive and rapid manner, to arrive at the desired map excerpt which is to be displayed for a user on the display device. The map excerpt which is displayed and which can be displaced is preferably the single map excerpt 25 displayed, so that no parts of the display device are "wasted" by the display of further map excerpts which 30 are not of interest to a user.

[0034] Provision is preferably furthermore made for 35 the actuation of the central region to enable a configuration, which can be displayed on the display

device, of the audio configuration system to be changed. This makes it possible to set or change the audio configuration of the vehicle in a simple manner, with a simple and intuitive and, above all, rapid changing or setting of the configuration being possible by the operating panel being coupled to the display device.

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BRIEF DESCRIPTION OF THE FIGURES

[0035] The figures illustrate schematically different exemplary embodiments of the invention by way of example.

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[0036] Figure 1 shows a longitudinal section through a first embodiment of the interior fitting according to the invention.

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[0037] Figure 2 shows a longitudinal section through a second embodiment of the interior fitting according to the invention.

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[0038] Figure 3 shows a longitudinal section through a third embodiment of the interior fitting according to the invention.

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[0039] Figure 4 shows a longitudinal section through a fourth embodiment of the interior fitting according to the invention.

[0040] Figures 5a and 5b show a perspective illustration and a longitudinal section through a fifth embodiment of the interior fitting according to the invention.

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[0041] Figure 6 shows the interior of a motor vehicle with interior fittings according to the invention.

5 **[0042]** Figures 7 to 13 show a detail of the interior fitting according to the invention with various illustrations of a display device.

10 **DESCRIPTION OF THE PREFERRED AND EXEMPLARY EMBODIMENTS**

[0043] Figure 1 illustrates a longitudinal section through a first embodiment of an interior fitting 16 according to the invention with a support body 1 and a sensor-functional planar structure 2, the latter being connected to the support body by adhesive bonding, and a covering layer 3 which is likewise connected to the sensor-functional planar structure by adhesive bonding.

20 **[0044]** Figure 2 shows a longitudinal section through a second embodiment of a fitting 16 according to the invention, in which a compressible intermediate layer 4 is additionally arranged below the covering layer 3 and above the sensor-functional planar element 2.

25 **[0045]** Figure 3 shows a longitudinal section through a third embodiment of a fitting 16 according to the invention, in which the compressible intermediate layer 4 is arranged below the sensor-functional planar element 2 and above the support body 1.

30 **[0046]** Figure 4 shows a longitudinal section through a fourth embodiment of the fitting 16 according to the invention with a support body 1, the sensor-functional planar structure 2 arranged above it and a covering layer 3 arranged on the side facing the interior space,

with a compressible intermediate layer 4 likewise being arranged between the covering layer 3 and the sensor-functional planar structure 2. Since this force which is exerted in a punctiform manner on the covering layer 5 may possibly be distributed in an undesirable manner over the full area of the sensor-functional planar structure 2, a locally force-transmitting molded piece 5 of a semi-stiff material, for example of silicone, is embedded in the compressible intermediate layer. An 10 insert 6 which comprises a spring 7 in conjunction with a pressure plate 8 has a similar effect. Furthermore, recesses 9 in the compressible intermediate layer 4, which recesses face the sensor-functional planar structure 2, counteract a "smoothing out" of the 15 pressure exerted on the covering layer, with that surface 10 of the compressible intermediate layer 4 which can be brought into contact with the sensor-functional planar structure 2 upon deformation being provided with projections 11.

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[0047] In an embodiment of the fitting 16 according to the invention that is illustrated in figure 5, a three-dimensional molded part 12 is arranged on the covering layer 3 covering the sensor-functional planar structure 2, which molded part firstly permits direct access to the covering layer 3 in the region of a recess 13 and secondly has a multiplicity of cutouts 14 in which keys 15 which act on the covering layer 3 and can be actuated by the vehicle occupant are arranged. The 25 cutouts 14 with the keys 15 are arranged here 30 centrically around the circular recess 13.

[0048] Figure 6 shows the interior of a motor vehicle with interior fittings 16 configured according to the 35 invention, 16.1 representing a central console, 16.2 a

cockpit, 16.3 a door lining and 16.4 the hub surface of a steering wheel.

[0049] Arranged on the central console 16.1 is a fitting part 16 which is similar to the fifth embodiment (according to figure 5) and has an operating panel 17 via which, for example, a navigation system can be controlled. On that surface of the cockpit 16.2 which is on the side facing the interior, an operating panel 19 can be fitted above the otherwise scarcely useable airbag cover 18, by means of which operating panel the interior illumination for the passenger or his/her individual air-conditioning control can be set. On the door lining 16.3 there is an operating panel 20 for the longitudinal or height adjustment of the driver's seat 21 by electric motor. Also arranged in the hub surface 16.4 is an operating panel 21 for setting the cruise control and an operating panel 22 for actuating the direction indicator.

[0050] Figure 7 illustrates a detail of the interior fitting 16 according to the invention with an operating panel 160. The operating panel 160 has a central region 161 and a plurality of peripheral regions, with only a first peripheral region 162, a second peripheral region 163 and a third peripheral region 164 being denoted in figure 7. Figure 7 furthermore illustrates an operating instrument 150 of a user (not illustrated), it being possible for the operating instrument 150 to be, in particular, the hand or a finger of the user. The operating instrument 150, which may also be designed, for example, as a pin, touches the operating panel 160 at a location of action identified by the reference number 151 and an arrow. The upper part of figure 7 furthermore illustrates a display device 30 which, divided into regions, has a comparable arrangement for

the regions of the operating panel 160. Again, on the display unit 30 or on the display device 30, a central display region is separated from a plurality of peripheral display regions 32. In the peripheral display regions 32, images or pictograms are illustrated on the display device 30 indicating the operating component or vehicle component which corresponds by an actuation of that region 161, 162, 163, 164 of the operating panel 160 which corresponds (i.e. is correspondingly arranged) to the display region 31, 32. In the upper part of figure 7, there are arranged or displayed on the display device 30, for example beginning at the top and continuing in the clockwise direction, setting functions for a car radio, setting functions for an air-conditioning control or ventilation of the vehicle, setting functions for operating a car telephone, setting functions for operating a fuel information system, setting functions for operating a mobility information system and setting functions for operating a navigation system. For example, the first peripheral region 162 of the operating panel 160 is assigned to the operation of the car telephone and the second peripheral region 163 of the operating panel 160 is assigned to the air-conditioning control or the ventilation of the vehicle. The third peripheral region 164 of the operating panel 160 is assigned to the operation or the display of information items of the fuel information system. Operation of this third peripheral region of the operating panel 160 causes the appearance, as illustrated in figure 8, on the display device 30 in the central display region 31 of a list of functions which can be carried out and which are used to control or operate the fuel information system. For example, a list with various entries, for example for distance traveled and for further information items, is displayed in the central display region 31. Otherwise,

the illustrations of figure 7 and figure 8 entirely correspond, with, in figure 8, in contrast to figure 7, a selection of the different information items of the fuel information system that are displayed on the 5 display device 30 to be possible by actuation of the central region 161 of the operating panel 160, i.e. by a location of action 151 on the central region 161 of the operating panel 160.

10 [0051] In the operating panel 160 of the interior fitting 16, provision is made for the regions 161 to 164 to differ or to be able to be differentiated discernibly for a user by the fact that the visible side, i.e. the surface of the operating panel 160, is 15 structured corresponding to the different regions 161 to 164. According to the invention, the structuring of the surface is, in particular, discernible to a user in a tactile manner. It is clear that the operation of the central region 161 of the operating panel 160 differs 20 depending on the group of functions selected by one of the peripheral regions 162 to 164 of the operating panel. In this case, the preselection and selection of a certain vehicle component to be operated define the operation of the operating panel 160 in a certain 25 operating mode assigned to this component or to this region of the operating panel 160. The functionality of the central region 161 therefore depends on the preselection of the vehicle component to be operated or of the operating mode by one of the peripheral regions 30 162 to 164 of the operating part 160, with it furthermore being preferably possible for the functionality of the central region 161 to be freely programmed. In this connection, it is possible, during the programming; for various movements, for example of 35 a finger 151 of a user on the operating panel 160, to be recognized, such as, for example, stroking, touching by means of a fingertip, rotating in a circulating

manner, pressing heavily or lightly, double clicking and more other movements. Of course, the free programmability is also still possible after purchasing the vehicle, so that, for example, new features of the 5 installed programming can be realized during the service life of the vehicle. The operating panel 160 is preferably integrated in the surface of the interior fitting 16, so that injuries, for example in accident situations, are largely avoided. Furthermore, according 10 to the invention the operating panel 160 can be largely integrated in the surface of the interior fitting 16, so that a visually attractive and not overburdened or overladen atmosphere or appearance of the area around the interior fitting 16 is possible.

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[0052] These comments apply to all of the operating panels described in conjunction with the present invention, in particular to all of the operating panels 160 described in figures 7 to 13, and so only the 20 differences will be discussed below.

[0053] Figure 9 illustrates a display device 30 and a detail of a display device 30 for the operation of a navigation system. An excerpt of a map is illustrated 25 in the central display region 31.

[0054] Figure 10 likewise illustrates a display device 30 with a map excerpt in the central display region 31, but with the map excerpt being enlarged in comparison 30 to the illustration in figure 9, i.e. more details of a (geographical) map region, but which is then smaller, being illustrated.

[0055] The operation of such an operating panel 160 35 which is set up for operation in the operating mode to operate a navigation system is illustrated in figures

11a, 11b and 11c. The central region 161 of the operating panel 160 corresponds to or represents the visible map excerpt or in general the visible graphics in the central display region 31. By touching the 5 central region 161 of the operating panel 160, a user can manipulate the visible map excerpt to the effect that he can displace it in all directions and furthermore can also change its size, i.e. "zoom". A change of the map excerpt both with regard to a 10 movement and with regard to a change in size can be carried out directly and simultaneously. In this connection, a movement of the map excerpt corresponds to a movement of a finger 151 of a user on the central region 161 of the operating panel 160. A circular 15 movement on the central region 161 of the operating panel causes a change in size of the illustrated map excerpt in the central display region 31. It is therefore not necessary to change, for example, a menu or the like in order to carry out the one or other 20 task. The change in the illustration of the map excerpt in the central display region 31 corresponds in this case to the location of action 151 on the central region 161 of the operating panel. This means that if a user touches the central region 161 to the right of the 25 center, the map excerpt will move to the right. If a user touches it at the bottom on the right, the map excerpt will move downward to the right. This results in a direct ability to influence both the map excerpt and also the enlargement factor of the map excerpt. 30 Furthermore, movements on the central region 161 of the operating panel 160 and on the visible part of the graphics or of the map excerpt are coordinated. This enables a selection or display of a desired map excerpt to be undertaken particularly rapidly and particularly 35 simply. It is therefore not necessary according to the invention to carry out a plurality of movement and enlargement steps in order finally to get to the

desired map excerpt or to the display of the desired map excerpt; on the contrary, it is possible, by means of simple movements on the central part 161 of the operating panel 160, to select the map excerpt. This 5 produces a particularly intuitive operator's guidance, since the fingers on the central region 161 of the operating panel correspond directly with the size or the position of the map excerpt illustrated. Figure 11a illustrates a directional actuation of the operating 10 panel 160 by means of arrows (not denoted by means of a reference number) on the central region 161 of the operating panel 160, and figure 11c illustrates a rotary actuation of the central region 161 of the operating panel 160 by means of an arrow (likewise not 15 denoted by means of a reference number) on the central region 161 of the operating panel 160. Figure 11b illustrates a combination of a directional actuation with a rotary actuation.

20 **[0056]** Figures 12 and 13 each illustrate an operating | panel 160 in the lower part of the figure and a display device 30 in the upper part of the figure, with figures 12 and 13 referring to the operating mode for setting and for operating an audio configuration 25 system. For the situation illustrated in figures 12 and 13, the interior fitting 16 (not denoted in each case) serves, by means of a pressure-sensitive operating panel 160, to simultaneously set the balance and the fader of an audio configuration system of the vehicle. 30 In this case, a location on the central region 161 of the operating panel 160 corresponds to the location in the vehicle or in the interior of the vehicle at which a sound produced by the audio system of the vehicle is heard particularly well. To change or set the audio 35 configuration system, the invention makes provision to touch the central region 161 of the operating panel 160 at a location which corresponds to the desired location

of the particularly good audio transmission or audio functionality in the vehicle, with the entire vehicle being at least schematically depicted in the central display region 31 and with the audio configuration 5 being defined by a location of the central region 161 of the operating panel 160 that corresponds to the desired transmission point being pressed. This means that, for example, a user touches the operating panel 160 to the right of the center of the central region 10 161, as a result of which the location of the audible audio source is likewise moved to the right in the interior of the vehicle. If a user touches the central region 161 of the operating panel 160 at the bottom on the right, this corresponds to a movement diagonally 15 downward to the right of the location of the audible audio source. By this means, it is advantageously possible according to the invention to set both the fader and the balance of the vehicle-internal audio system at the same time and therefore to operate the 20 audio configuration system in a particularly convenient manner. An operating concept of this type can be used universally, for example also in a domestic sphere, in an office sphere, in the area around a truck or in any other vehicle.

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[0057] According to the invention, it is therefore possible, in a very much more rapid and simpler manner, to bring about an optimum configuration of the audio system of the vehicle (or other space), which was 30 conventionally possible only by repeated and awkward individual adjustments both of the balance and of the fader. According to the invention, it is therefore possible to bring about the optimum audio configuration of the vehicle in a particularly intuitive and rapid 35 manner. It is thereby also possible that the "fader" and "balance" functions, which are actually different acoustically, can be identified by the user as being

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adjustable and are recognized as being essential for the wellbeing in an acoustic entertainment in the vehicle or in other spaces.

List of reference numbers

- 1 Support body
- 2 Sensor-functional planar structure
- 3 Covering layer
- 4 Compressible intermediate layer
- 5 Molded piece
- 6 Inset
- 7 Spring
- 8 Pressure plate
- 9 Recesses
- 10 Surface
- 11 Projections
- 12 Three-dimensional molded part
- 13 Recess
- 14 Cutouts
- 15 Keys
- 16 Interior fitting
- 16.1 Central console
- 16.2 Cockpit
- 16.3 Door lining
- 16.4 Hub surface of a steering wheel
- 17, 19, 20, 22 Operating panel
- 18 Airbag cover
- 21 Driver's seat
- 30 Display device
- 31 Central display region
- 32 Peripheral display regions
- 150 Operating instrument
- 151 Location of action
- 160 Operating panel
- 161 Central region
- 162 First peripheral region
- 163 Second peripheral region
- 164 Third peripheral region

Patent Claims

1. An interior fitting (16) for a vehicle, in particular for a motor vehicle, comprising a support body (1) which is provided, at least in some regions, with a sensor-functional planar structure (2) and with a covering layer (3) on the side facing the interior, it being possible for different output signals to be generated by means of the planar structure (2) as a function of the location of action thereupon, characterized in that the covering layer (3) is of flexible design and completely covers the sensor-functional planar structure (2).
- 15 2. The interior fitting (16) as claimed in claim 1, characterized in that the planar structure (2) is of pressure-sensitive design.
- 20 3. The interior fitting (16) as claimed in claim 1 or 2, characterized in that the covering layer (3) is designed as a textile planar structure (2), in particular as a woven fabric.
- 25 4. The interior fitting (16) as claimed in claim 1 or 2, characterized in that the covering layer (3) consists of a leather or artificial leather or a film.
- 30 5. The interior fitting (16) as claimed in one of the preceding claims, characterized in that the covering layer (3) is arranged directly on the sensor-functional planar structure (2).
- 35 6. The interior fitting (16) as claimed in one of the preceding claims, characterized in that at least one compressible intermediate layer (4), in particular of a soft foam plastic, is arranged between the covering layer (3) and the sensor-functional planar structure

(2).

7. The interior fitting (16) as claimed in one of the preceding claims, characterized in that at least one 5 compressible intermediate layer (4), in particular of a soft foam plastic, is arranged between the support body (1) and the sensor-functional planar structure (2).

8. The interior fitting (16) as claimed in claim 6 or 10 7, characterized in that force-transmitting molded pieces (5) of a stiff or semi-stiff material are arranged in the compressible intermediate layer (4).

9. The interior fitting (16) as claimed in one of the 15 preceding claims, characterized in that the interior fitting (16) has means on the side facing the interior for the visual orientation of the operator.

10. The interior fitting (16) as claimed in one of the 20 preceding claims, in particular as claimed in claim 9, characterized in that an illuminating device is arranged below the covering layer (3).

11. The interior fitting (16) as claimed in claim 10, 25 characterized in that the illuminating device is of planar design and is preferably arranged between the support body (1) and the covering layer (3), in particular directly below the sensor-functional planar structure (2).

30

12. The interior fitting (16) as claimed in claim 11, characterized in that the illuminating device comprises an electroluminescent film, an OLED or polyLED.

35 13. The interior fitting (16) as claimed in one of claims 9 to 12, characterized in that the means for the visual orientation comprise images which can be

projected from the vehicle interior onto the covering layer (3).

14. The interior fitting (16) as claimed in one of
5 claims 9 to 13, characterized in that the means for the visual orientation comprises optical waveguides arranged in the covering layer (3) and/or in the sensor-functional planar structure (2).

10 15. The interior fitting (16) as claimed in one of the preceding claims, characterized in that the interior fitting has means for the tactile orientation of the operator.

15 16. The interior fitting (16) as claimed in claim 15, characterized in that the means comprise a structured molded part (12) of a stiff or semi-stiff material.

17. The interior fitting (16) as claimed in claim 16,
20 characterized in that the structured molded part (12) has recesses (13).

18. The interior fitting (16) as claimed in one of
claims 15 to 17, characterized in that the means for
25 the tactile orientation have changeable structures in the interior fitting.

19. The interior fitting (16) as claimed in one of
claims 15 to 18, characterized in that the means for
30 the tactile orientation comprise regions of different surface temperature.

20. The interior fitting (16) for a vehicle, in particular as claimed in one of the preceding claims,
35 characterized in that the interior fitting (16) has an operating panel (160), the operating panel (160) having a central region (161) and a plurality of peripheral

regions (162, 163).

21. The interior fitting (16) as claimed in claim 20,
characterized in that the central region (161) of the
5 operating panel (160) is round.

22. The interior fitting (16) as claimed in claim 20
or 21, characterized in that the peripheral regions
(162, 163) of the operating panel (160) are arranged in
10 the manner of sectors around the central region (161).

23. The interior fitting (16) as claimed in claim 20,
21 or 22, characterized in that the peripheral regions
(162, 163) of the operating panel (160) completely
15 surround the central region (161) of the operating
panel (160).

24. The interior fitting (16) as claimed in one of
claims 20 to 23, characterized in that the interior
20 fitting (16) is assigned a display device (30), with it
being possible for information items to be displayed on
the display device (30) as a function of an operating
mode.

25 25. The interior fitting (16) as claimed in claim 24,
characterized in that different vehicle components can
be operated by means of the operating panel (160) as a
function of the operating mode.

30 26. The interior fitting (16) as claimed in one of
claims 20 to 25, characterized in that the operating
mode can be changed as a function of the actuation of
the central region (161) and/or of the peripheral
regions (162, 163) of the operating panel (160),
35 preferably as a function of the actuation of the
peripheral regions (162, 163) of the operating panel
(160).

27. The interior fitting (16) as claimed in one of claims 20 to 26, characterized in that a different operating mode is assigned the operation of a different vehicle component, in particular the air-conditioning control, the ventilation, a car radio, a navigation device, a car telephone, an audio configuration system, a fuel information system and/or a mobility information system.

10

28. The interior fitting (16) as claimed in one of claims 20 to 27, characterized in that, when an operating mode is set, the operation of the vehicle component assigned to the set operating mode takes place as a function of the actuation of the central region (161) and/or of the peripheral regions (162, 163) of the operating panel (160), preferably as a function of the actuation of the central region (161) of the operating panel (160).

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29. The interior fitting (16) as claimed in one of claims 20 to 28, characterized in that the actuation of the central region (161) enables a list selection, which can be displayed on the display device (30), of functions which can be carried out and/or of information items which can be displayed.

30. The interior fitting (16) as claimed in one of claims 20 to 29, characterized in that the actuation of the central region (161) enables a map excerpt, which can be displayed on the display device (30) to be displaced by a directional actuation and to be changed in size (zoomed in/out) by a rotary actuation, the map excerpt being in particular the single map excerpt displayed on the display device (30).

31. The interior fitting (16) as claimed in one of

claims 20 to 30, characterized in that the actuation of the central region (161) enables a configuration, which can be displayed on the display device (30), of the audio configuration system to be changed.

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32. A method for operating vehicles, in particular motor vehicles, with the use of an interior fitting (16) as claimed in one of the preceding claims, characterized in that a continuous adjustment of that component of the vehicle which is to be operated is associated with the direction (x direction, y direction) and/or speed (dx/dt , dy/dt) of a continuous displacement of the location of action on the sensor-functional planar structure (2).

15

33. The method as claimed in claim 32, characterized in that an adjustment of that component of the vehicle which is to be operated is associated with the pressure (z direction) which is exerted on the sensor-functional planar structure (2).

25

34. The method as claimed in claim 33, characterized in that a continuous adjustment of that component of the vehicle which is to be operated is associated with a continuous change of the pressure.

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35. A method for operating vehicles, in particular motor vehicles, in particular as claimed in one of claims 32 to 34, characterized in that an operating panel (160) is assigned a display device (30), an operating panel (160) and a display device (30) being provided.

35

36. A method for the production of an interior fitting (16) as claimed in one of claims 1 to 31, characterized by the following steps:

- producing a support body (1)

- 30 -

- laminating the sensor-functional planar structure (2) onto the support body (1)
- laminating the covering layer (3) onto the sensor-functional planar structure (2) and optionally onto 5 exposed regions of the support body (1).

37. A method for the production of an interior fitting (16) as claimed in one of claims 1 to 31, characterized by the following steps:

- 10 - producing a support body (1)
- forming a sandwich from the covering layer (3) and the sensor-functional planar structure (2)
- laminating the sandwich onto the support body (1).

15 38. The method as claimed in claim 37, characterized in that the covering layer (3) is of gas-permeable design and the sensor-functional planar structure (2) is positioned in relation thereto by application of a negative pressure on that surface of the covering layer 20 (3) which is on the side facing the interior.

39. A method for the production of an interior fitting (16) as claimed in one of claims 6 to 31, characterized by the following steps:

- 25 - producing a support body (1)
- placing the covering layer (3) and the sensor-functional planar structure (2) into a die
- filling the interior space between covering layer (3) and sensor-functional planar structure (2) with foam
- 30 - laminating the composite produced in this manner onto the support body (1).

40. The method as claimed in claim 39, characterized in that the covering layer (3) is plastically preformed 35 before being placed into the die.

ABSTRACT

An interior fitting for a vehicle, particularly for a motor vehicle, comprises a supporting body, which is provided, at least in areas, with a sensor-functional planar structure and with a covering layer that is located on the side facing the interior. Different output signals can be generated by means of the planar structure according to the location of action thereupon. According to the invention, the covering layer is flexibly designed and completely covers the sensor-functional planar structure.